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TITLE: Method and circuit
arrangement for reducing noise in
digitised television
signals

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ABSTRACT:

CHG DATE=19990617 STATUS=O> A noise reduction of digitised television signals should become effective even with movements in the image content and not perceptibly impair the image sharpness.

An estimated-value signal for the noise component is calculated (6) from the difference (3) of a frame-to-frame comparison (1, 5) and the difference (4) between the noisy input signal (1) and the calculated estimated-value signal (6) is formed which supplies the reduced-noise output signal (2) which is stored for subsequent calculations (5). <IMAGE>

DOCUMENT-IDENTIFIER: US 20010055421 A1

TITLE: Method of iterative
segmentation of a digital picture

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Summary of Invention Paragraph - BSTX (12):

[0012] Segmentation methods utilizing watershed transformation employ as the basis for segmentation a representation of the color gradients in the picture, begin segmentation in the most homogeneous picture regions, and successively, i.e. by and by, expand the segments into more heterogeneous picture regions. In this way homogeneous picture regions are well segmentable, uniformly heterogeneous picture regions however with more difficulty. Simultaneous segmentation of homogeneous and heterogeneous picture regions, or of picture regions having different degrees of heterogeneity, can be performed only with great difficulty. In addition the method disregards the original color information.

Summary of Invention Paragraph - BSTX (41):

[0036] In a further preferred embodiment of the present invention if the homogeneity criterion is satisfied with the already merged picture objects as well as with the one of one and several contiguous picture objects, feature distributions of the already merged picture objects and the one of one and several contiguous picture objects are calculated and based thereon, a pertinence of the boundary picture object is determined in such a manner that the boundary picture object is allocated to the one picture object wherein a feature value of the boundary picture object occurs most frequently or that the boundary picture object is allocated to a picture object in a probabilistic manner by calculating probabilities based on a **frequency** of occurrence of the feature value of the boundary picture object in the already merged picture objects and the one of one and several contiguous picture objects.

Detail Description Paragraph - DETX (69):

[0142] The determination and exchange carried out in steps S310 and S320 can be carried out such that if the homogeneity criterion is satisfied with the already merged picture objects as well as with one of one and several contiguous picture objects, feature distributions of already merged picture objects and the one of one and several

contiguous picture objects are calculated and based thereon, a pertinence of the boundary picture object is determined in such a manner that the boundary picture object is allocated to the one picture object wherein a feature value of the boundary picture object occurs most frequently or that the boundary picture object is allocated to a picture object in a probabilistic manner by calculating probabilities based on a **frequency** of occurrence of the feature value of the boundary picture object in the already merged picture objects and the one of one and several contiguous picture objects. For example, for the feature distributions respective histograms of the features of the already merged picture objects and the one of one and several contiguous picture objects are referred to.

Detail Description Paragraph - DETX (101):

[0172] The method of the present invention achieves high flexibility, high-quality segmentation in a desired resolution, simultaneous representation of the segmentation in various degrees of resolution and in the form of a hierarchical object structure, processing of highly textured pictures, separating highly textured picture regions from more **homogeneous picture** regions, separation of picture regions even

when they present overlapping feature ranges, processing of pictures having any dimensionality which are, for example, generated by a one-, two-, or three-dimensional imaging or other technique, and object-related admission of specific homogeneity criteria such that for example line structures or picture regions having a constant color development are also subjected to segmentation.

Detail Description Paragraph - DETX (103):

[0174] The method largely works in the absence of beforehand knowledge, i.e. in the absence of beforehand knowledge with the exception of setting a tolerance, and is extremely flexible with respect to the desired picture resolution, i.e. the average number of picture elements per segment. The method can be performed largely in an automated manner, it does not require interactive intervention. It processes pictures or picture-type data records of any desired dimensionality. At a given resolution, very good segmentation results in terms of differential diagnosis are obtained. Identical structures are segmented jointly and separated from other structures. It is particularly also suited for finding and differentiating between textured picture objects having overlapping feature ranges, or for processing high-noise pictures.

Other than the numerous prior art methods, the method of the present invention does not employ pixel classification and subsequent segmentation. Picture elements are rather segmented based on homogeneity criteria in such a manner that picture structures are combined in an expedient manner in terms of differential diagnosis. With respect to quality, it is superior to segmentation methods relying on thresholds, and it is superior to methods which perform segmentation with respect to particular texture features, in flexibility of the desired resolution and the capability of processing most variegated textures at the same time. With the segments thus obtained, essentially more information is available for a subsequent classification than with single picture elements. The classification probabilities thus made possible may therefore be increased distinctly. A maximum degree of condensation and utilisation of the existing information is achieved. This is not possible with prior art methods which employ partial ranges or distributions defined beforehand in the feature space and/or do not concurrently resolve in a plurality of planes. Differently textured objects are clearly delimited even when they present comparatively wide and overlapping feature distributions.

Claims Text - CLTX (17):

17. The method of claim 15, wherein if the homogeneity criterion is satisfied with the already merged picture objects as well as with the one of one and several contiguous picture objects, feature distributions of the already merged picture objects and the one of one and several contiguous picture objects are calculated and based thereon, a pertinence of the boundary picture object is determined in such a manner that the boundary picture object is allocated to the one picture object wherein a feature value of the boundary picture object occurs most frequently or that the boundary picture object is allocated to a picture object in a probabilistic manner by calculating probabilities based on a **frequency** of occurrence of the feature value of the boundary picture object in the already merged picture objects and the one of one and several contiguous picture objects.